Chapter II

DOE CERCLA Compliance Strategy

Comprehensive Environmental Response, Compensation, and Liability Act

II. DOE CERCLA COMPLIANCE STRATEGY

II.A DOE Organizations Responsible for CERCLA Compliance

This report was prepared by the Department of Energy's (DOE's) Office of Environmental Restoration (EM-40) within the Office of Environmental Management (EM). The Office of Environmental Management was created in 1989 to consolidate responsibility within DOE for environmental management activities at former nuclear weapons complex sites. Additional EM functions related to environmental restoration at former nuclear weapons complex sites include 1) ensuring worker safety and health, 2) managing and planning budgets, 3) resolving legal and compliance issues, 4) implementing public participation programs, 5) safely transporting all DOE materials, and 6) minimizing waste generated.

Within the EM organization, the following offices play an important role in Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) compliance activities:

- The Office of Waste Management (EM-30) is responsible for the treatment, storage, and disposal of large volumes of wastes generated by environmental restoration activities.

- The Office of Environmental Restoration (EM-40) is responsible for the cleanup of contamination at DOE nuclear weapons sites and for facility decommissioning.

- The Office of Technology Development (EM-50) is responsible for the development of new and more effective technologies to address contamination and management of wastes at DOE sites.

- The Office of Nuclear Material and Facility Stabilization (EM-60) is responsible for nuclear materials stabilization, facility deactivation, and the safe transition of facilities for decommissioning by the Office of Environmental Restoration.

This report also covers CERCLA compliance activities at sites that are not in the nuclear weapons complex. Information on these sites was provided by the following DOE organizations:

- Bonneville Power Administration,

- Western Area Power Administration,

- Office of Energy Research,

- Federal Energy Technology Center - Morgantown, and

- Federal Energy Technology Center - Pittsburgh.

However, EM assumes CERCLA compliance responsibility for some of the above mentioned organizations for remediation at their sites.

DOE's Office of Environmental Policy and Assistance (EH-41) within DOE's Office of Environment, Safety and Health (EH) assists all DOE organizations with CERCLA compliance activities. The mission of the Office of Environmental Policy and Assistance organization is to 1) develop Department-wide environmental protection policies and complex-wide strategies for protecting the public and the environment and for

attaining and maintaining environmental compliance with internal and external environmental requirements, and 2) assist program and field offices in averting environmental compliance problems. In addition, the Office of Environmental Policy and Assistance serves as the CERCLA Docket Coordinator. The Coordinator receives the Environmental Protection Agency's (EPA's) initial letter of proposed listings to the docket and NPL, and is responsible for verifying the accuracy of the proposed listings with the program and field offices in a formal response to the EPA.

II.B. Legal Context for DOE's Remediation Activities

The DOE's remediation activities are governed by CERCLA, the Resource Conservation and Recovery Act (RCRA), the National Environmental Policy Act (NEPA), and other applicable laws. CERCLA addresses the uncontrolled releases of hazardous substances to the environment and the cleanup of inactive waste sites. RCRA addresses the management of hazardous waste and requires that permits be obtained for DOE facilities that treat, store, or dispose of hazardous or mixed waste. RCRA also requires corrective action to address releases of hazardous waste constituents from operating facilities. NEPA requires that Federal agencies consider the environmental effects of major Federal actions in the decision making process. It is the Department's policy to rely on the CERCLA process for review of actions to be taken under CERCLA and to incorporate, to the extent practicable, NEPA values (such as analysis of cumulative, offsite, ecological, and socioeconomic impacts) into CERCLA documentation. The Department may, however, after consulting with its stakeholders and as a matter of policy, integrate the CERCLA and NEPA processes for specific proposed actions. It is also part of the Department's policy to take steps to ensure opportunities for early public involvement in all CERCLA, RCRA, and NEPA processes.

II.C. Environmental Contamination at DOE Facilities

The CERCLA Annual Report addresses environmental contamination at the following types of DOE facilities:

- Facilities formerly in the nuclear weapons complex (i.e., production facilities, laboratories, and testing facilities);
- Electrical substations and electrical substation support facilities;
- Energy research and development laboratories; and
- Facilities involved in research and testing activities associated with alternative energy technologies.

The Office of Environmental Restoration (ER) is generally responsible for the cleanup of facilities formerly in the nuclear weapons complex as well as other radioactively contaminated sites that Congress has requested DOE to clean up. Figure II-1 shows the locations of DOE facilities subject to CERCLA Section 120 formerly in the nuclear weapons complex.

The Bonneville Power Administration (BPA) and Western Area Power Administration (WAPA) are responsible for the DOE electrical substations and electrical substation support facilities that are subject to CERCLA Section 120. The Office of Energy Research is responsible for energy research and development laboratories subject to CERCLA Section 120. The Morgantown Energy Technology Center (now the Federal Energy Technology Center - Morgantown) and the Pittsburgh Energy Technology Center (now the Federal Energy Technology Center - Pittsburgh) are responsible for the DOE alternative energy technology research

and development facilities that are subject to CERCLA Section 120. Figure II-2 shows the locations of DOE facilities subject to CERCLA Section 120 that are not in the nuclear weapons complex.

DOE Facilities Formerly in the Nuclear Weapons Complex

The environmental contamination problems at facilities formerly in the nuclear weapons complex are unlike those associated with facilities in other industries. These problems include unique radiation hazards, unprecedented volumes of contaminated water and soil, and a vast number of contaminated structures including reactors and chemical plants. Major environmental contamination problems associated with steps in the nuclear weapons production process are briefly described below.

- Uranium mining and milling produced large volumes of mill tailings which contain toxic heavy metals and radioactive radium and thorium.

- Uranium enrichment operations caused extensive contamination of the environment with radioactive materials, solvents, polychlorinatedbiphenyls, heavy metals, and other toxic substances.

- Fuel and target fabrication resulted in releases of uranium dust, landfills contaminated with chemicals, and contaminated facilities.

- Reactor irradiation produced highly radioactive spent fuel and contaminated facilities.

- Chemical separations produced highly radioactive and hazardous chemical waste, as well as wastewater that contained small amounts of radionuclides and chemicals. Discharge of some of this wastewater directly to the ground caused widespread contamination. Chemical separation processes also produced contaminated facilities.

- Fabrication of weapons components produced plutonium-contaminated waste and facilities.

- Weapons assembly and maintenance resulted in soil contaminated with high-explosive waste, fuel and oil leaks, and discharged solvents.

- Research, development, and testing activities resulted in highly radioactive underground craters and soils and debris contaminated with low-level waste.

In most cases, the environmental contamination caused by nuclear weapons production activities resulted from materials production and waste management practices that would be considered inadequate by today's standards. Additional information on the environmental contamination resulting from nuclear weapons production is available in the following DOE publications:

- *Closing the Circle on the Splitting of the Atom: The Environmental Legacy of Nuclear Weapons Production in the United States and What the Department of Energy Is Doing About It*, January 1996 (second printing);

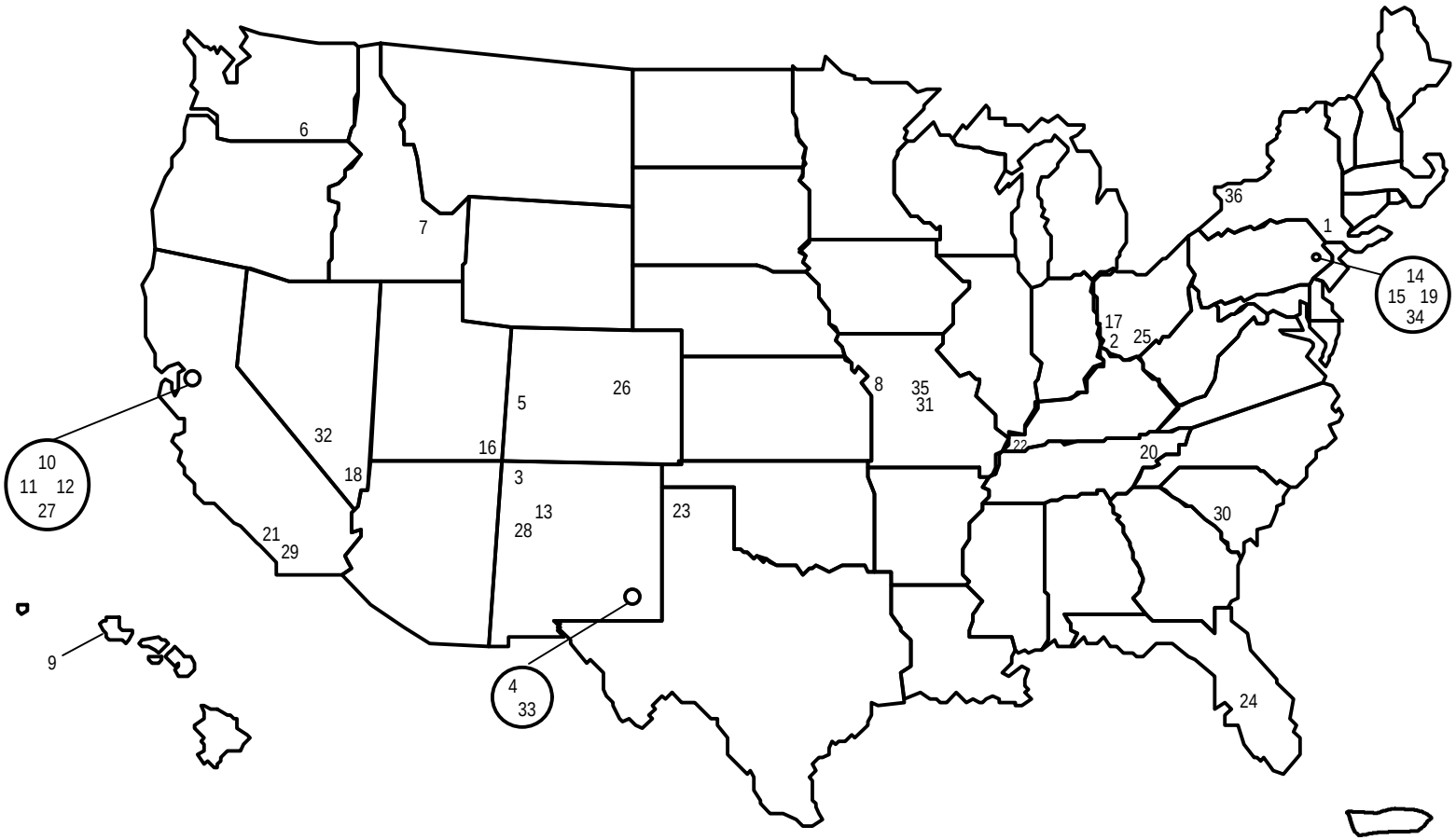

Figure II-1. DOE Facilities/Sites Formerly in the Nuclear Weapons Complex and Subject to Section 120 of CERCLA

1 Colonie Site, NY
2 Fernald Environmental Management Project, OH
3 Gasbuggy, NM
4 Gnome-Coach, NM
5 Grand Junction Project Office Remedial Action Project, CO
6 Hanford Site, WA (excluding Pacific Northwest National Laboratory
7 Idaho National Engineering Laboratory, ID
8 Kansas City Plant, MO
9 Kauai Test Facility, HI
10 Laboratory for Energy-Related Health Research, CA
11 Lawrence Livermore National Laboratory - Livermore Site, CA
12 Lawrence Livermore National Laboratory - Site 300, CA
13 Los Alamos National Laboratory, NM
14 Maywood Site, NJ
15 Middlesex Sampling Plant, NJ
16 Monticello Mil Site and Monticello Vicinity Properties, UT
17 Mound Plant, OH
18 Nevada Test Site, MV
19 New Brunswick Laboratory, NJ
20 Oak Ridge Reservation (excluding Oak Ridge National Laboratory)
21 Oxnard Facility, CA
22 Paducah Gaseous Diffusion Plant, KY
23 Pantex Plant, TX
24 Pinellas Plant, FL
25 Portsmouth Uranium Enrichment Complex, OH
26 Rocky Flats Environmental Technology Site,CO
27 Sandia National Laboratories/California, CA
28 Sandia national Laboratories/New Mexico, NM
29 Santa Susana Field Laboratories, CA
30 Savannah River Site, SC
31 St. Louis Site, MO
32 Tonopah Test Range, NV (Sandia National Laboratories/Tonopah)
33 Waste Isolation Pilot Plant, NM(Carlsbad, NM)
34 Wayne Site, NJ
35 Weldon Spring Site Remedial Action Project, MO

Figure II-1. DOE Facilities/Sites Formerly in the Nuclear Weapons Complex and Subject to Section 120 of CERCLA - Key (Continued).

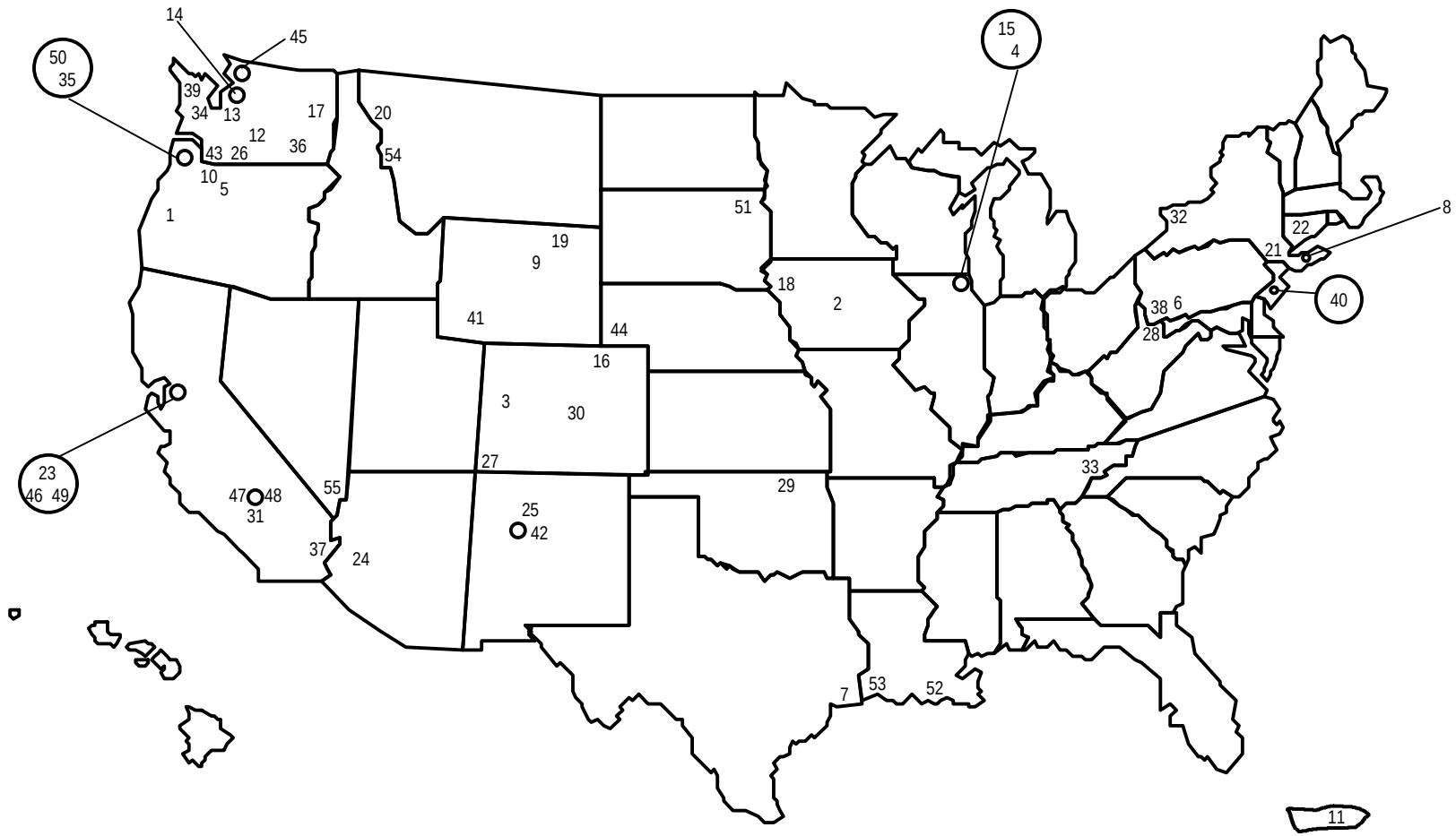

Figure II-2. DOE Facilities/Sites Subject to Section 120 of CERCLA and Not in the Nuclear Weapons Complex

1 Alvey Maintenance Headquarters, OR
2 Ames Laboratory, IA
3 Anvil Points Facility, Naval Oil Shale Reserve No. 3, CO
4 Argonne National Laboratory - East, IL
5 Bake Oven Substation, OR
6 Bettis Atomic Power Laboratory, West Mifflin, PA
7 Big Hill Site, TX
8 Brookhaven National Laboratory, NY
9 Casper Field Branch, WY
10 Celilo Converter Station, OR
11 Center for Energy and Environmental Research, PR
12 Columbia Basin Project AEC Zone 2,4-D Site, WA
13 Columbia Substation, WA
14 Covington Substation, WA
15 Fermi National Accelerator Laboratory, IL
16 Fort Morgan Substation, CO
17 G.H. Bell Substation and Maintenance Complex, WA
18 Hinton Hazardous Waste Storage Facility, IA
19 Hoe Creek, WY
20 Hot Springs Substation TLM Complex, MT
21 Knolls Atomic Power Laboratory, Niskayuna and West Milton Site, NY
22 Knolls Atomic Power Laboratory, Windsor Site, CT
23 Lawrence Berkeley National Laboratory, CA
24 Liberty Substation, AZ
25 Lovelace Inhalation Toxicology Research Institute, NM
26 Midway Substation, WA
27 Montrose Power Operations Center, CO
28 Morgantown Energy Technology Center, WV
29 National Institute for Petroleum and Energy Research, OK
30 National Renewable Energy Laboratory, CO
31 Naval Petroleum Reserve Nos. 1 & 2, CA
32 Niagara Falls Storage Site, NY
33 Oak Ridge National Laboratory, TN (at Oak Ridge Reservation)
34 Olympia Substation, WA
35 Ostrander Substation, OR (Oregon City, OR)
36 Pacific Northwest National Laboratory, WA (at Hanford Site)
37 Parker Dam Switchyard, CA
38 Pittsburgh Energy Technology Center, PA
39 Port Angeles, WA
40 Princeton Plasma Physics Laboratory, NJ
41 Rock Springs Oil Shale Retort, WY
42 Ross Aviation, Inc., NM
43 Ross Complex, WA
44 Sishc Foundry Site, NE
45 Snohomish Substation, WA
46 Stanford Linear Accelerator Center, CA
47 Texaco Section 8 Central Solid Waste Site, CA
48 Texaco Section 8 Gas Plant, CA
49 Tracy Pump and Substation, CA
50 Troutdale Substation, OR
51 Watertown Maintenance Facility, SD
52 Weeks Island, LA
53 West Hackberry Site, LA
54 Western Environmental Technology Office, MT
55 Yucca Mountain Site, NV

Figure II-2. DOE Facilities/Sites Subject to Section 120 of CERCLA and Not in the Nuclear Weapons Complex - Key (Continued).

- *Taking Stock: A Look at the Opportunities and Challenges Posed by Inventories from the Cold War Era*, January 1996;

- *Charting the Course: The Future Use Report*, April 1996;

- *The 1996 Baseline Environmental Management Report*, June 1996 (DOE/EM-0290)

- *Accelerating Cleanup: Focus on 2006 Discussion Draft*, June 1997 (DOE/EM-0327)

- *Estimating the Cold War Mortgage: The 1995 Baseline Environmental Management Report*, March 1995 (DOE/EM-0232).

These publications may be ordered from the Environmental Management Information Center at 1-800-7EM-DATA.

Other Facilities

Other facilities in the DOE complex include electrical substations; facilities supporting electrical power distribution; petroleum and oil shale reserve facilities; and petroleum, coal, oil shale, and energy research facilities. Environmental contamination problems at these types of facilities are generally similar to those found at these types of facilities in the private sector. These problems resulted primarily from spills and leaks, and from past materials and waste management practices that would generally be considered inadequate by today's standards.

II.D DOE's Accelerating Cleanup: Paths to Closure

The EM program is responsible for the cleanup of radioactive, chemical and other hazardous wastes that were left after 50 years of United States production of nuclear weapons and associated nuclear research and development activities. A major portion of EM's cleanup program is conducted under CERCLA. In FY 97 the Department began preparation of a report, *Accelerating Cleanup: Paths to Closure*, which provides an overarching strategic context for DOE's CERCLA implementation efforts.

Paths to Closure, the first version of which was released in June 1998, is intended to provide Congress, stakeholders, regulators, and Tribal Nations with a holistic view of EM's cleanup mission, ongoing issues, accomplishments, and vision. In 1996, EM implemented a vision of accelerating cleanup efforts to complete cleanup activities at as many sites as possible by 2006. EM intends to complete cleanup at most of its 53 remaining sites by 2006. At the ten remaining sites, including the five largest sites, treatment will continue beyond 2006 for the remaining waste streams. Public participation has been considered a pivotal part in the *Paths to Closure* process throughout the DOE complex. EM has a strong commitment to work with stakeholders, Tribal Nations, and regulators in the implementation of the *Paths to Closure* effort and vision.

EM has made significant progress toward achieving its cleanup goals and realizing the *Paths to Closure* vision. Over the last two years, EM has been successful in redesigning the management structure of the work scope for the entire EM complex and in implementing a revised management system that places greater emphasis on performance goals and accountability.

Paths to Closure provides a comprehensive management tool that provides:

- An integrated path forward for the management of the EM program, based on a site-by-site, project-by-project life-cycle foundation;

- A basis to evaluate EM's annual budgets in the context of long-term cleanup and closure requirements and projections; and

- A response to the concerns of Congress, stakeholders, regulators, and Tribal Nations.

Paths to Closure is a conceptual presentation of management strategies that will be employed at individual sites to achieve EM's goals of accelerated cleanup while maintaining its commitment to protect the health and safety of the public, workers, and the environment.

Although the *Paths to Closure* report attempts to provide a conceptual picture of where the EM program is headed, it is not a decision or budget document. EM will continue to make individual decisions in accordance with the applicable requirements of CERCLA and other applicable statues. *Paths to Closure* describes the scope, schedule, and costs for projects where CERCLA decisions have already been made and those for which such decisions have not yet been made. In the latter cases, *Paths to Closure* makes planning assumptions about future CERCLA decisions in order to develop scope, schedule, and cost estimates; however, such assumptions do not bias future CERCLA decisions.

Most cleanup decisions are made at the site level (with appropriate Headquarters oversight). Decisions that have complex-wide implications are made by Headquarters. In many cases final approval authority resides with the EPA or state regulators.

The EPA or state environmental regulators in effect are the final decision-makers for cleanup work conducted under CERCLA and RCRA because of their regulator approval rules. EM's role is to comply with schedules negotiated with state and federal regulators for conducting studies, proposing recommended courses of action, and implementing actions once regulators have made decisions.

Public participation is an important element of the EM program's decision making process. For projects managed under CERCLA, EM relies on the CERCLA process to incorporate public participation opportunities.

II.E. Approach to Environmental Restoration Used by Other DOE Organizations

Bonneville Power Administration

The BPA markets and transmits power from 29 Federal dams and one non-Federal nuclear plant in the Pacific Northwest. BPA has built one of the largest and most reliable transmission systems in the United States. Bonneville owns and operates 363 electrical substations and maintains 15,012 circuit miles of transmission lines.

BPA currently has 13 sites on the docket. One of these sites, Ross Complex, was placed on the NPL in November 1989 and deleted from the NPL in September 1996. Of the other docket sites, two, Covington Substation and Celilo Converter Station, are currently undergoing site inspections under CERCLA. Contaminant concerns at Covington include polynuclear aromatic hydrocarbons and polychlorinated biphenyls (PCBs). Celilo is a unique facility within the Bonneville system because power is converted from

alternating current (AC) to direct current (DC) and vice versa, utilizing mercury arc valves. Mercury-contaminated soils have been identified as a result of past maintenance practices associated with this equipment.

The majority of environmental restoration activities at BPA are voluntary cleanups conducted under state authority. The most common contaminant encountered at these sites is non-PCB mineral oil. The contamination is usually contained within the soils immediately surrounding oil-filled equipment. These sites are commonly identified when construction projects or major site modifications involve soil disturbance.

BPA also is in the midst of a long-range multi year voluntary PCB capacitor replacement program. The purpose of the program is to replace PCB-containing electrical capacitors (which routinely fail, resulting in reportable PCB releases and localized soil contamination) with non-PCB capacitors. This involves taking the substation out of service, removing the old capacitor yard equipment (including metal support racks), excavating soil contaminated in the past with PCBs, and constructing a new non-PCB capacitor yard. In some cases a new yard must be constructed first and brought on line to avoid shutting down a crucial substation; then the old yard can be removed and cleanup initiated. This program is very expensive, not because of soil remediation costs as much as costs associated with purchasing new capacitors and properly incinerating old PCB capacitors. Due to budgetary constraints and operational issues, several substations are prioritized for capacitor replacement each year. Originally, about one-fourth (90 to 100) of BPA's 363 substations had electrical equipment that contained PCBs.

Western Area Power Administration

WAPA is responsible for the Federal electric power marketing and transmission functions in 15 central and western states encompassing a 1.3 million-square-mile geographic area. WAPA provides power to more than 600 wholesale power customers. These wholesale power customers, in turn, provide service to millions of retail consumers in the States of California, Nevada, Montana, Arizona, Utah, New Mexico, Texas, North Dakota, South Dakota, Iowa, Colorado, Wyoming, Minnesota, Nebraska, and Kansas.

WAPA has nine sites listed on the docket and does not have any sites currently listed on the NPL. The Administration has taken a proactive role by implementing a Facility Evaluation Program. The purpose of this program is to evaluate all WAPA facilities for sources of oil, hazardous substances, pollutants, or contaminants and suspected releases into the environment. WAPA has also proactively conducted PA/SIs at sites that are potentially contaminated. The Montrose Power Operations Center, located in Montrose, Colorado, notified EPA of hazardous waste storage activities in the early 1980s, as did the Watertown Substation in Watertown, South Dakota, and Casper Maintenance Yard in Casper, Wyoming. None of these sites are RCRA hazardous waste treatment, storage, or disposal facilities, but because they have facilities for storage of PCB wastes, the sites were listed on the docket. Preliminary Assessments (PAs) and screening Site Investigation (SI) final reports have been completed and submitted to EPA.

Federal Energy Technology Center - Morgantown

Federal Energy Technology Center - Morgantown is owned and operated by DOE as a research and development center and is listed on the docket. During 1992 and 1993, it was DOE's lead research center for local gasification, fluidized-bed combustion, unconventional gas recovery, gas stream cleanup, heat engines, fuel cells, underground coal gasification, oil shale retorting, combined-cycle component integration, and instrumentation and control technologies.

The environmental management program at the DOE Federal Energy Technology Center - Morgantown addresses all areas of environmental concern, including surface water and groundwater quality, air quality, and solid and hazardous waste disposal. The program focuses primarily on the treatment and disposal of industrial, contaminated, and sanitary wastewater; the disposal of solid and hazardous wastes; the minimization of air pollutant emissions; the monitoring of surface water, groundwater, and air quality at the Federal Energy Technology Center - Morgantown site and in the surrounding area; the decommissioning, decontamination, and disposal of onsite research facilities no longer in use; and the identification, characterization, and cleanup of offsite property where Federal Energy Technology Center - Morgantown sponsored research and development activities.

Federal Energy Technology Center - Pittsburgh

The Federal Energy Technology Center - Pittsburgh is the Federal government's most comprehensive coal technology research center, and is listed on the docket. It performs a major role in the Department of Energy's mission to ensure an adequate supply of clean energy from coal. The research programs emphasize new technologies that hold promise for increasing the industrial use of clean coal in the long term.

The Federal Energy Technology Center - Pittsburgh has developed and implemented a program to identify and evaluate inactive hazardous waste disposal sites to determine the necessity of remediation. This program included a Phase I Site Sampling and Analysis Investigation, whose scope included reviewing present and historical operations of DOE facilities at Federal Energy Technology Center - Pittsburgh, particularly as they related to hazardous material use, storage, disposal, and handling. Additionally, previous environmental investigations at the site were reviewed. The previous environmental work was supplemented by the Sampling and Analysis Investigation, and a comprehensive database for the DOE facilities has been compiled.

The Sampling and Analysis Investigation investigated soils, surface water, stream sediments, and groundwater throughout all the areas at the Federal Energy Technology Center - Pittsburgh that are occupied or potentially impacted by DOE operations. The work plans included a Sampling and Analysis Plan for the investigation of soils, surface waters, and stream sediments, and a Comprehensive Groundwater Protection Management Plan for the investigation of groundwater. An additional component of the Sampling and Analysis Investigation was an Underground Storage Tank Management Plan, which reviewed the compliance status of DOE-managed underground storage tanks, sought to confirm the uncertain disposition or existence of a number of tanks, and investigated the potential for residual contamination due to the operation or removal of these tanks.

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